



Aligning fisheries aid with international development targets and goals

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ARTICLE INFO

Keywords:

Development aid
Fisheries management
Small-scale fisheries
Small-island developing states
Pacific islands and territories
Least developed countries
Sustainable development goals

ABSTRACT

Official development assistance (ODA) is intended to spur progress and increase security among recipient countries. Billions in ODA have been allocated to fisheries to support nutrition and livelihoods worldwide. Yet, from 2010 to 2015, fisheries allocations decreased by > 30%, while grants for non-fisheries sectors increased by > 13%. Globally, grants for climate change adaptation and mitigation fell for fisheries, while rapidly increasing in sectors like agriculture and forestry. In Oceania, a region highly dependent on fisheries for food security and particularly vulnerable to climate change, disbursements fell by 44%. Grants for fisheries research, education and training fell in absolute numbers, and as a proportion of total ODA to fisheries. These findings are out of alignment with recent international commitments, including the Sustainable Development Goals (2015), The Future We Want (2012), and relevant Aichi Targets (2010). Risk aversion among donors; redirection of climate finance into other sectors; and allocation decisions based on factors unrelated to fisheries are identified as contributing to observed findings. Increasing the volume of fisheries-related ODA and better aligning it with international commitments could bring substantial co-benefits and contribute to the sustainable use of marine ecosystems, support sustainable trade and economic opportunities, increase adaptive capacity, and foster human well-being.

1. Introduction

The importance of capture fisheries and aquaculture for income, food security and livelihoods, and the severity of the challenges faced by these sectors, particularly in small island developing states (SIDS) and least developed countries (LDCs), have contributed to their prominent inclusion in recent international policy documents. In 2010, Parties to the Convention on Biological Diversity adopted the Strategic Plan for Biodiversity, including multiple targets focused on marine ecosystems. Two years later, the United Nations General Assembly endorsed the “Future We Want”. This document dedicates 20 paragraphs specifically to “oceans” – more than any other thematic issue – with commitments such as to “assist developing countries [...] to sustainably manage and realize the benefits of sustainable fisheries” (paragraph 174). In 2015, similar language was used in the Sustainable Development Goals (SDGs), with SDG 14 entirely dedicated to Life Below Water. Sub-targets include to, “by 2030, increase the economic benefits to [SIDS] and [LDCs] from the sustainable use of marine resources” (SDG 14.7) and “increase scientific knowledge, develop research capacity and transfer marine technology” (SDG 14.A). (See [Supplementary Table S1](#) for an extended list of international

commitments related to the conservation and sustainable use of marine resources).

This growing focus on marine issues within the international community is understandable, for fisheries and aquaculture supply some 17% of animal protein and provide livelihoods to an estimated 12% of the world's population [1]. Yet, capture fisheries suffer from over-capitalization and over-capacity, with a shrinking number of developing stocks, and none considered undeveloped [2]. In recent decades, the increase in fish supply has been supported by aquaculture, which surpassed capture fisheries in production volumes for the first time in 2014 [3]. However, today's production and distribution patterns, and the human and technological capacity limitations faced by many developing countries, indicate that aquaculture may not be able to support food security where it will be most threatened in the future [4,5]. In addition, both sectors, particularly capture fisheries, are threatened by climate change [6–8]. Warming temperatures, declining oxygen concentrations, pH and primary production, are projected to lead to shifts in the distribution, productivity and resilience of fish stocks across the Exclusive Economic Zones of many of the world's poorest countries [9,10]. Associated declines in fisheries catch potential are likely to have a marked negative impact on the availability of and

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access to fish, in turn affecting countries' food security, livelihoods, gross domestic product, and marine tourism industry [11–17].

One option for the international community to translate words into action is through the allocation of official development assistance (ODA). Since its definition in 1972, ODA has been a key metric of support provided by donors to achieve development cooperation targets [18]. It encompasses assistance from official agencies, aimed at promoting economic development and welfare in eligible countries and territories, either bilaterally or through multilateral institutions as defined by the Organization for Economic Co-operation and Development (OECD) Development Assistance Committee (DAC) (e.g., World Bank, United Nations agencies) [19]. While an aspirational target to provide ODA at a rate of 0.7% of Gross National Income (GNI) remains unmet by the majority of the DAC member states [20], the total volume of ODA has been increasing for decades [18]. In 2016, preliminary figures showed a record total of USD142.6 billion in ODA being disbursed to support the implementation of projects around the world – an increase of 7.1% compared to 2015 [21,22]. ODA is a key source of finance for many of the world's least developed countries, despite its contentiousness due in part to concerns about creating dependency, and the varied motivations of donor countries [18,23–25].

The following study assesses (i) whether the wealth of recent commitments to advancing marine issues has been reflected in ODA allocations to the capture fisheries and aquaculture sector; and (ii) whether an increase in climate change related projects has been observed over time, given that ODA allocations are considered one of the primary global mechanisms to mitigate against and build adaptive capacity to the impacts of climate change [26,27].

2. Methods

This study considers recent trends in ODA allocations to support the fisheries sector in the 146 ODA recipient countries and territories around the world – defined according to per capita income levels [28] (Supplementary Table S2). OECD reporting on ODA combines capture fisheries and aquaculture under the single category of “fisheries”, and this same umbrella term is used throughout the remainder of this paper for the sake of consistency. The analysis draws on accounting data provided through the OECD Creditor Reporting System from 2010 until 2015, the most recent year in the system. The year 2010 was selected as it marked the point at which a series of standardized project markers were mainstreamed, enabling further analysis based on the classification of projects according to their primary objectives (e.g., “gender equality” or “climate adaptation”) [29]. The OECD Creditor Reporting System encompasses both bilateral and multilateral aid – both of which are included in this research. The OECD DAC has taken particular steps to avoid double-counting of financial flows by providing reporting distinctions for bilateral ODA as well as core contributions to multilateral organizations and earmarked ODA to be channelled through multilateral organizations [29]. Some caveats are necessary regarding what constitutes ODA, which encompasses grants, soft loans (having at least a 25% grant element) and the provision of technical assistance [21]. First, by definition ODA excludes aid from DAC members to countries that are not included on the list of recipient countries. As such, transfers of funds to dependent territories, including for instance, New Caledonia (France), Guam (USA), Pitcairn (UK), and the Commonwealth of the Northern Marianas (USA), while significant, are not included in the dataset. Second, funds that are transferred for purposes other than development or welfare, towards the military, for instance, are also excluded. Third, Chinese development assistance is not reflected in the OECD data [30].

Statistics are available from OECD for both ODA commitments and actual ODA disbursements. Commitments are recorded in full in the year they are made, despite disbursement of financial resources, goods and services often extending across multiple years. Commitments also exceeded actual disbursements by between 5.6% and 19.7% from 2007

until 2015, with the largest gap coinciding with the global financial crisis of 2007–2008 [21] and the subsequent decision by some countries not to follow through with stated commitments [31]. Therefore, this analysis draws exclusively on records of annual disbursements of ODA, and uses current prices (fixed to 2015 levels using OECD deflators) rather than constant prices. Loans and ‘other’ non-grant forms of ODA were also excluded as such flows typically mark one-off transfers and are not indicative of multi-year trends (e.g., a USD 306 million export credit in 2014 to the Philippines to rebuild fisheries after Typhoon Yolanda [32]). Extended trends could provide better indications of whether ODA allocations to fisheries projects are being influenced by international commitments.

Over the past decade a growing number of non-DAC member states, most prominently the United Arab Emirates, Kuwait and Saudi Arabia, have started to report ODA grants, which totalled over USD 14.5 billion in 2015 (more than 11% of all grants disbursed in 2015) [21]. Countries from outside the DAC membership are therefore an increasingly important element in the donor landscape, and all reported flows from both DAC and non-DAC countries have been included in this research [33].

To contextualise our results and provide explanatory narrative beyond arguments outlined in the literature, which is limited, a number of ad hoc and informal unstructured interviews were conducted with key donors, asking them for their insights on the findings of this study.

3. Results

Grants for development cooperation projects in the fisheries sector have fallen considerably in recent years. In 2015, a total of 814 projects with a funding volume of USD166 million were reported; a change of –30.6% from 2010. The trend is more conspicuous when contrasted with the 13.3% increase in total volume of ODA grants over the same period, and increases for the agriculture and forestry sectors (Fig. 1). Decreases in ODA grants for fisheries were likewise evident across regional groupings, with the largest changes in the Americas (–70.5%), Asia (–49.5%) and Oceania (–43.8%) (Fig. 2). Countries in Africa saw a slower rate of decline (–16.1%), and continued to be recipients of roughly half of ODA grants for fisheries projects.

In addition to the decrease in funding volumes, there has been a change in the focus of fisheries ODA. Financial flows are classified in the OECD Creditor Reporting System (CRS) according to purpose codes. Under the overall code for Fisheries (313), there are five sub-categories for “fishing policy and administrative management” (CRS code 31310),

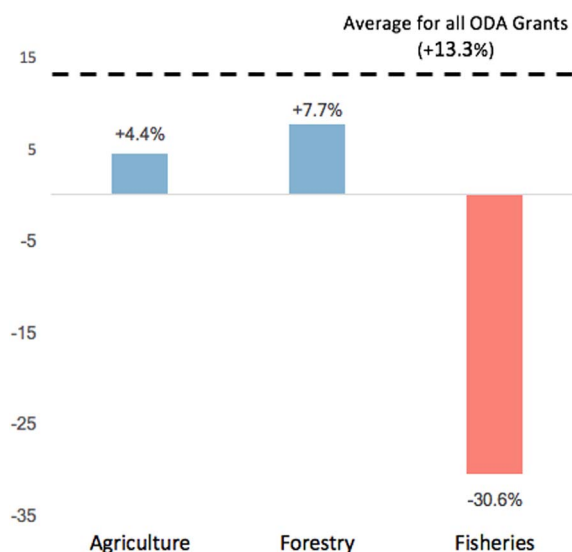


Fig. 1. Percentage change (2010–2015) in the overall value of ODA grants to production sectors.

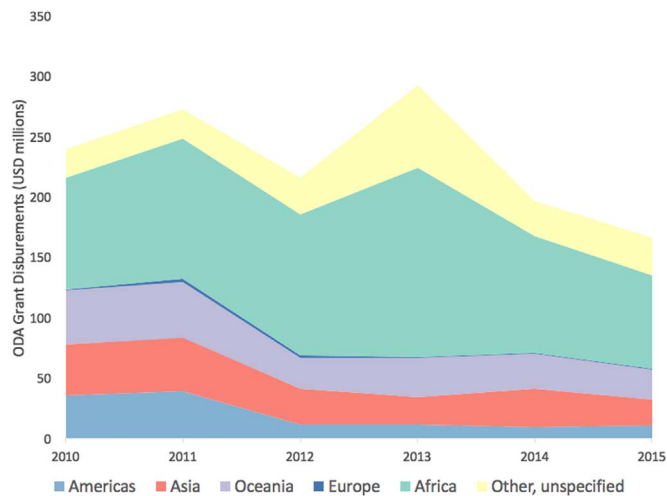


Fig. 2. Regional changes (2010–2015) in allocation of ODA grants for fisheries projects.

“fishery development” (CRS code 31320), “fishery education and training” (CRS code 31381), “fishery research” (CRS code 31382) and “fishery services” (CRS code 31391). No changes have been made to the numbering or description of these codes since 2010. From 2010 to 2015, the proportion of fisheries ODA allocated to fishing policy and administrative management almost doubled from around 28% to nearly 49% of total grant disbursements (Fig. 3). Allocations for fishery education and training, fishery research and fishery services all decreased in both total volume, as well as in proportion to overall fisheries ODA.

Regardless of CRS categories, donors also have the option of indicating the primary objective of funding, and a shift has been observed from 2010 to 2015 in these stated objectives for fisheries projects. Funding was mostly allocated to projects focusing on the environment, trade development or biodiversity, with environmental projects showing the largest increase (Fig. 4). Conversely, disbursements to projects with a principal focus on climate issues – both adaptation and mitigation – decreased. In a sectoral context, the trend is more pronounced, as the proportion of funding for projects with a climate focus in the agriculture sector increased by over 380%, and in the forestry sector by over 45%. The –77.4% change in such projects in the fisheries sector far exceeded an overall decrease across ODA projects (–6.2%) (Fig. 5). The agriculture, forestry and fishery sectors likewise include comparable CRS sub-sectors for research funding (Agricultural research: 31182, Forestry research: 31282, Fishery research: 31382). Allocations for research across all three sectors fell from 2010 to 2015, with flows to fishery research decreasing by 78% (Fig. 6).

4. Discussion

Despite increasing awareness of the threats faced by the marine realm, and fisheries in particular, and the growing prominence of

marine issues in international fora and policy documents (Supplementary Table S1), ODA allocations for fisheries projects were found to be declining between 2010 and 2015. These changes are unexpected. For one thing, the recent decrease in fisheries ODA coincides with an increase in the total volume of grants for non-fisheries sectors. The trends are particularly surprising against the backdrop of a changing climate and for regions like Oceania. Indeed, for Pacific Island Countries and Territories (PICTs), oceanic fisheries are a crucial source of government revenue, contribute to GDP and employment, and tend to represent a majority of exports [34,35]. Tuna catches from the Western and Central Pacific Ocean supply over 50% of the tuna sold on the global market [36,37], representing a total estimated value of almost USD4.1 billion [35]. While landings from the coastal zone are more modest in comparison, they are critical in terms of their impact for local and indigenous people through the provision of livelihoods and food security [38–41]. Fish consumption in the Pacific islands averages 3–5 times that of other nations globally, and fish supplies 50–90% of the animal protein in communities’ diets [42]. Research is also showing that these countries are some of the most vulnerable to climate change impacts [6,43–45] on human health, fresh water availability, marine ecosystems and tourism – with flow-on effects to livelihoods, culture and customs. Yet, funding to fisheries projects in Oceania dropped by almost half (43.8%) from 2010 to 2015. A comparison of ranking in recipients of fisheries grants with their rankings on a global index of vulnerability of national economies to climate change [6] only exhibited a weak correlation ($R^2 = 0.209$, $p < 0.05$).

4.1. Understanding the changing priorities for funding of fisheries projects

A number of explanations exist for the seeming disconnect in internationally stated and prioritized policy objectives, and the allocation of ODA grants. Arguments are presented under three broad categories: (1) risk aversion among donors; (2) redirection of climate finance; (3) allocation based on factors unrelated to fisheries.

4.1.1. Risk aversion

Donors may be moving away from sustainable fishery projects due to what some deem an “unacceptably high-risk profile”, with successful implementation often dependent on collaboration among a wide range of entities [32,46]. The prevalence of data-poor fisheries among many recipient countries constitutes another risk, making it challenging to distinguish the extent to which falling catches are attributable to climate change, overfishing, or other factors, and making the implementation of relevant management measures more complex [47]. People’s perceptions are a further challenge, as the impacts of climate change or ecosystem degradation are often more immediately visible in terrestrial settings than marine. Designing and gaining support for corresponding adaptation or mitigation efforts suffer from similar conceptual struggles. The 2008/09 food crisis, for instance, galvanised a number of aid organizations to support investments in projects to secure the assets of the poor, optimize water use and boost yields, to

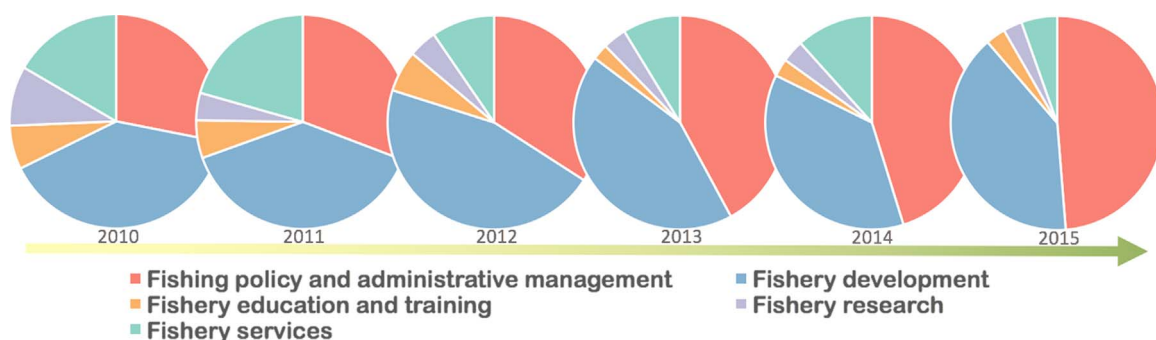


Fig. 3. Percentage of ODA funding for fisheries projects classified by sub-sector according to the OECD Creditor Reporting System (CRS) purpose codes.

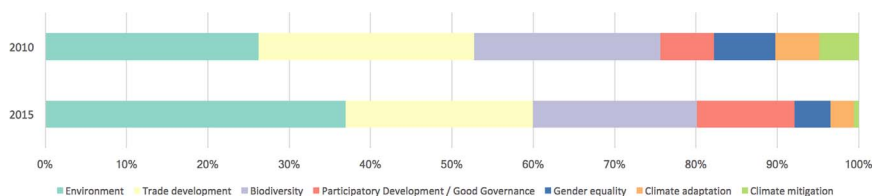


Fig. 4. Volume of ODA grants for fisheries projects with corresponding stated primary objectives.

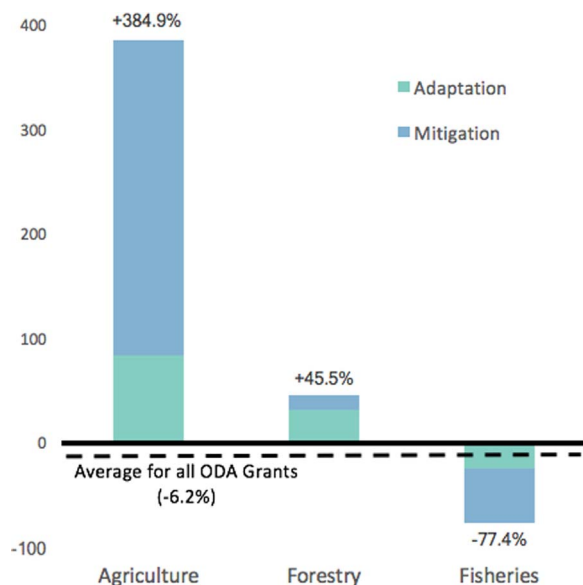


Fig. 5. Percentage change (2010–2015) in ODA funding (USD millions) to projects with climate adaptation or climate change mitigation as their primary objective.

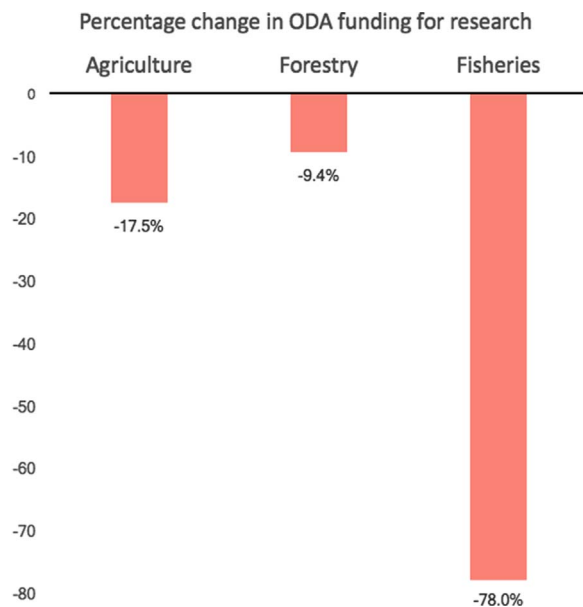


Fig. 6. Percentage change (2010–2015) in ODA funding (USD millions) for research activities across production sectors.

meet projections of the need for a 50% increase in overall production in developing countries by 2050 [48]. Results of such projects are easy to quantify and impacts accrue relatively quickly, which is of advantage to donors. As a result, donors may see less risk in investing in sectors such as forestry and agriculture, for which climate change impacts and opportunities for mitigation and adaptation are better understood [49]. However, while agricultural investments have been a powerful tool to improve the well-being of low-income communities, many SIDS have

minimal arable land area and depend heavily on the marine sector to meet their nutritional requirements. A greater focus on implementing critical, independent research on the impact of aid to the fisheries sector, demonstrating the difference generated through support as well as sectors that contribute most to meeting needs, could help alleviate this and move fisheries back up the international development agenda [50].

4.1.2. Redirection of climate finance

While the number of fisheries ODA-funded projects with a primary objective of climate change adaptation or mitigation declined, this may represent a strategic redirection of finance rather than a notion that such issues are of lesser importance within the fisheries sector. Investments in industrial or commercial sectors, for instance, could bring greater returns, on shorter timeframes, and with greater certainty. Projects aimed at diversification of livelihoods are also a meaningful avenue for improving the adaptive capacity of countries heavily dependent on fisheries. In such cases, investment in education, health services or infrastructure could also contribute to increased adaptive capacity and mobility away from fully or over-exploited fisheries into other sectors [51]. Some projects with a primary focus on the “environment” (Fig. 4) address fisheries management and small-scale fisheries, while others are tangentially related to climate adaptation and mitigation, underscoring the complexity of marine systems and the challenges of creating clear typologies [51,52]. Indeed, the CRS system allows for a considerable degree of flexibility with regard to the classification of projects, meaning that some grants bringing substantial primary or secondary benefits to the fisheries sector may have been excluded from this analysis. Support aimed at developing transport and cold storage infrastructure, for instance, could benefit a wide range of agricultural and seafood supply chains, but easily be classified under a variety of CRS codes (e.g., transport equipment: 32172, fishery services: 31391; agricultural services: 31191). Similarly, the establishment of marine protected areas is often inspired by conservation targets, but can generate positive effects for fisheries [53–55]. In other cases, fisheries-relevant ODA contributions may be masked when activities carry labels corresponding to their largest budgetary allocations. For instance, projects focused on dam construction or satellite imagery acquisition may have CRS codes for “infrastructure” or “new technologies”, but provide substantial financial support for fisheries through components on port redevelopment, or monitoring, control and surveillance activities, respectively. Greater precision in the CRS system could allow for more refined analysis, but would remain problematic for large-scale projects with both intended and unintended impacts extending across multiple sectors. Regardless of classification system, such efforts could lead to a more productive and resilient marine resource base [56,57]. Finally, knowledge of future allocations slated under the multi-billion-dollar Green Climate Fund (with disbursements starting in 2016 and therefore not included here) may also have encouraged donors to shift away from climate change as a primary focus, seeing ODA as an opportunity to tackle other complementary issues. This is at odds with recent work emphasizing that ODA is a key mechanism for climate change adaptation and mitigation [27] and the fact that none of the 45 projects approved so far by the Green Climate Fund focuses specifically on fisheries [58]. However, activities that seek to develop integrated flood management in catchment areas or target coastal adaptation are highly likely to benefit coastal systems and associated marine resources

through a reduction in siltation levels and improved water quality, for example, with expected flow-on effects for fisheries [59].

4.1.3. Allocation based on factors unrelated to fisheries

Decision making on whether to allocate ODA to the fisheries sector could also be motivated simply by concerns that go beyond development needs or vulnerability. One typology of the primary motivations for providing ODA includes three broad categories: (1) altruistic, ethical and humanitarian concerns; (2) strategic, political and commercial interests; (3) concerns about maintaining stability within the international system [60]. Increased geopolitical volatility and conflicts worldwide have underscored the urgent need to rebuild or consolidate basic infrastructure, invest in health care and medical responsiveness as well as education, and ODA provides one pathway for addressing such needs. Identifying primary motivations for allocation decisions based on this typology will be difficult in many instances. ODA-funded projects focused on climate change adaptation or mitigation, for instance, could fit comfortably within all three categories, yet have decreased as a proportion of all fisheries projects.

4.2. Aligning fisheries grants with international priorities

One reason fisheries feature prominently in international policy documents is that they exist at the nexus of so many aspects of human well-being. A recent assessment found that achieving SDG 14 on “Life Below Water” would contribute to achieving all the other SDGs as well [61]. Efforts to meet sub-targets on increasing economic benefits to SIDS and LDCs, and eliminating overfishing, illegal and destructive practices were identified as promising the largest number of co-benefits with other SDG targets. Yet a recent report grouping ODA allocations according to the most relevant SDGs found that funding actually declined, especially in relative terms compared to agriculture, with top donors like the USA and Japan each allocating well under 1% of funding towards achieving SDG 14 [86].

While aid is often highlighted as a means to spur economic growth and alleviate poverty, recent evidence points to aid inflows generally creating positive change [62], but providing diminishing returns beyond a certain threshold [30]. Applied to the context of fisheries, increases in ODA grant volumes are certainly no guarantee of improved fisheries outcomes [23,63]. However, targeted investments that specifically promote the sustainable use of marine resources and contribute to the development and implementation of adaptation strategies carry the most promise – unlike a large number of fisheries grants in the past that were poorly invested, negotiated as part of fisheries access agreements, and/or allocated towards increasing productivity, often encouraging or facilitating overexploitation [35,64,65]. Key here will be for aid allocations to fisheries to focus on increasing equity, access, sustainability, monitoring and evaluation as well as good governance mechanisms [41,66]. Recipient countries also bear responsibility to list sustainable fisheries high on their national agendas, therefore ensuring country ownership over corresponding development activities [67].

Sustainable fisheries make good economic sense not only as a source of employment and regular catches [68], but also because of their nutritional value [69]. Coastal communities in low-income, food deficit countries are particularly reliant on the micronutrients provided by fish. Many countries suffering from overfished stocks and poor management have seen a continued decline in net food production and, in combination with foreign dependence and global trade, an increase in the export of high-market value fish products and import of low-market value products for domestic consumption (e.g., canned meats, instant noodles and cereals) [70–72]. The loss of access to seafood in the diet will lead to malnutrition in many contexts, because there is no perfect nutritional substitute for seafood [67]. In countries where a lack of market integration has not provided cheap processed foods and where other animal-source foods are often prohibitively expensive, an increase in the prevalence of micronutrient deficiencies could be expected. In

contrast, in countries where market integration has led to easy access to cheap processed foods, the increasing prevalence of metabolic diseases (i.e., obesity, hypertension, diabetes) is likely. In PICTs for example, a large proportion of the population is overweight, micronutrient deficiencies are common, and about 40% of the region's population has been diagnosed with a non-communicable disease, notably diabetes and hypertension, accounting for 76% of all deaths [71,73]. Investments in, particularly small-scale, sustainable co-managed fisheries programs would help enhance resilience to climate change, ensure that vulnerable communities have access to healthy food while preserving traditional diets, and limit the spread and prevalence of diet-related chronic non-communicable diseases [74,75].

Much can be done by the research community to reduce perceptions of risk among donors in allocating grants for fisheries. Support for further research can improve understanding of the future impacts of climate change on fish stocks and catch potential in countries where fisheries represent critical sources of nutrition for the majority of a country's population [11,76] and link results from modelling work with on the ground monitoring and assessment efforts to improve adaptation strategies. An urgent need exists for the development of frameworks applicable to and for greater research capacity within ODA recipient countries [77]. Building local capacity to collect and analyse ocean and fisheries data and conduct long-term monitoring, would likewise help to distinguish human-caused environmental change from natural variability [78]. Practical research could also focus on how to improve fishers' access to less vulnerable stocks, and transfer fishing effort away from vulnerable marine ecosystems like coral reefs on to coastal pelagic stocks, for instance through further experimentation with strategically located fish aggregating devices (FADs), which coastal fishers can easily access and that do not threaten existing stocks [76,79]. Aligning monitoring and evaluation systems with meaningful socio-ecological indicators informed by integrated assessment models could enable the allocation of grants to projects that address climate mitigation and adaptation within the remit of donor time horizons [80].

Based on feedback from partners within donor institutions, since 2015, a number of positive signals, particularly in the Pacific region, seem to indicate that the emphasis put by some leaders on the need to prioritise oceans and fisheries may be starting to gain traction. First, there appears to be greater uptake in climate financing, due to several SIDS (including PICTs) securing accreditation that allows them to access available funding. Second, the Vessel Day scheme run by Parties to the Nauru Agreement [36,81] has enabled members to dramatically expand revenues to PICTs from the offshore sector with almost no ODA input beyond technical and capacity support to members. This could therefore be touted as a success, with initial support contributing to foundational development, institutional capacity-building and the creation of a sustainable financing mechanism. Further ODA disbursements are perhaps best directed at achieving systematic, sustained changes in fishing patterns and maritime behaviour by implementing and effectively enforcing global, regional and sub-regional arrangements as well as towards less stable sectors. Third, the new Roadmap for Sustainable Fisheries approved in 2015 [82] includes the “New Song” [50], the inshore strategy driven by the Secretariat for the Pacific Community, with Australia [83] and New Zealand committing important bilateral ODA to support activities under this initiative. Fourth, case studies that demonstrate the viability as well as diversity and flexibility of the Blue Economy concept [84] seem to be catalysing the flow of finance into fisheries and oceans issues. This positive impact is underscored in a recent review [85] that attempts to better define the Blue Economy's key components and opportunities for integration across scales, time and stakeholders to equitably and sustainably manage marine resources with a view to maximise economic returns.

Looking beyond ODA, philanthropic aid to the fisheries sector and, more broadly, to sustainable ocean management, has been rapidly increasing in recent years. A partial analysis of such funding sources from 2010 to 2015 found an upwards trend and an annual average volume of

USD317 million [32]. While the majority of philanthropic aid originated from North America, and was allocated for projects in the same region, philanthropic aid has been increasing in other regions of the world as well [32] and can make a targeted difference in fisheries management. In addition, the variety of reporting mechanisms, databases and coding systems for international grants hampers systematic evaluations. Building on this assessment of ODA grants, analysis of the broader context of international support would therefore be a fruitful area for further study.

International cooperation is at the heart of the United Nations charter, and a driving principle for recent conferences that have resulted in a wealth of international commitments emphasizing (1) the importance of the conservation and sustainable use of marine ecosystems; (2) the need to increase benefits to SIDS and LDCs from fisheries; (3) the need for immediate action towards climate change adaptation and mitigation; and (4) the capacity needed to inform science-based management of marine resources. ODA remains a key instrument available to countries to achieve this agreed agenda, and while recent activities show promise, much remains to be done to ensure that ODA allocations for fisheries under climate change are in line with international development goals and targets.

Acknowledgements

This is a product of the Nippon Foundation Nereus Program, a collaborative initiative by the Nippon Foundation and partners including Stockholm University and the University of British Columbia. The authors would like to thank the following colleagues for their constructive input and insightful feedback: Jan Bebbington, Brooke Campbell, Chris Golden, Quentin Hanich, Perry Head, François Henry, Edmund McManus, Henrik Österblom, Mathieu Thenaisie, Maria Schultz and Nobuyuki Yagi.

Appendix A. Supplementary material

Supplementary data associated with this article can be found in the online version at <http://dx.doi.org/10.1016/j.marpol.2017.11.018>.

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